3.3.5.2 Northern Dry Forest

3.3.5.2.1 Community Overview

This forest community occurs on nutrient-poor sites with excessively drained sandy or rocky soils. The primary historic disturbance regime was catastrophic fire at intervals of ten to one hundred years. Dominant trees of mature stands include jack and red pines and/or Hill's oak. Large acreages of this forest type were cut and burned during the catastrophic logging of the late 19th and early 20th century. Much of this land was then colonized by white birch and/or quaking aspen, or converted to pine plantations starting in the 1920s. Today's forests have a greatly reduced component of pines, and a greater extent of aspen, red maple, and oaks as compared to historic conditions. Common understory shrubs are hazelnuts, early blueberry, and brambles (*Rubus* spp.); common herbs include bracken fern, starflower, barren-strawberry, cow-wheat, trailing arbutus, and members of the shinleaf family (*Chimaphila umbellata*, *Pyrola* spp.). Vast acreages of cutover land were also planted to pine, or naturally succeeded to densely stocked "dry" forests.

Northern Dry Forest community types most commonly occur on large, continuous glacial outwash or lake plain landforms. On these extensive xeric plains, historic fires were less likely to be halted by wetlands or mesic hills. Here, burns could be large and intense, creating ideal conditions for establishment of Northern Dry Forest.

3.3.5.2.2 Vertebrate Species of Greatest Conservation Need Associated with Northern Dry Forest

Fifteen vertebrate Species of Greatest Conservation Need were identified as moderately or significantly associated with northern dry forest (Table 3-115).

Table 3-115. Vertebrate Species of Greatest Conservation Need that are (or historically were) moderately or significantly associated with northern dry forest communities.

Species Significantly Associated with Northern Dry Forest
Birds
Kirtland's Warbler
Connecticut Warbler
Red Crossbill
Species Moderately Associated with Northern Dry Forest
Birds
Spruce Grouse
Whip-poor-will
Black-backed Woodpecker
Least Flycatcher
Golden-winged Warbler
Herptiles
Northern Prairie Skink
Mammals
Northern Long-eared Bat
Silver-haired Bat
Eastern Red Bat
Hoary Bat
Northern Flying Squirrel
Gray Wolf

In order to provide a framework for decision-makers to set priorities for conservation actions, the species identified in Table 3-115 were subject to further analysis. The additional analysis identified the best opportunities, by Ecological Landscape, for protection, restoration, and/or management of both northern dry forest and associated vertebrate Species of Greatest Conservation Need. The steps of this analysis were:

- Each species was examined relative to its probability of occurrence in each of the 16 Ecological Landscapes in Wisconsin. This information was then cross-referenced with the opportunity for protection, restoration, and/or management of northern dry forest in each of the Ecological Landscapes (Tables 3-116 and 3-117).

- Using the analysis described above, a species was further selected if it had both a significant association with northern dry forest and a high probability of occurring in an Ecological Landscape(s) that represents a major opportunity for protection, restoration and/or management of northern dry forest. These species are shown in Figure 3-24.

Table 3-116. Vertebrate Species of Greatest Conservation Need that are (or historically were) *significantly* associated with northern dry forest communities and their association with Ecological Landscapes that support northern dry forest.

Northern Dry Forest	Birds (3)*		
Ecological Landscape grouped by opportunity for management, protection, and/or restoration of this community type	Kirtland's Warbler	Connecticut Warbler	Red Crossbill
MAJOR			
Northeast Sands			
Northwest Sands			
IMPORTANT			
Central Sand Plains			
Northern Highland			
Superior Coastal Plain			
PRESENT (MINOR)			
Central Sand Hills			
North Central Forest			
Northwest Lowlands			

Color Key

= **HIGH probability the species occurs in this Ecological Landscape**

= **MODERATE probability the species occurs in this Ecological Landscape**

= **LOW or NO probability the species occurs in this Ecological Landscape**

*** The number shown in parentheses is the number of Species of Greatest Conservation Need from a particular taxa group that are included in the table. Taxa groups that are not shown did not have any Species of Greatest Conservation Need that met the criteria necessary for inclusion in this table.**

Table 3-117. Vertebrate Species of Greatest Conservation Need that are (or historically were) *moderately* associated with northern dry forest communities and their association with Ecological Landscapes that support northern dry forest.

Northern Dry Forest	Birds (5)*					Herptiles (1)	Mammals (6)					
Ecological Landscape grouped by opportunity for management, protection, and/or restoration of this community type	Spruce Grouse	Whip-poor-will	Black-backed Woodpecker	Least Flycatcher	Golden-winged Warbler	Northern Prairie Skink	Northern Long-eared Bat	Silver-haired Bat	Eastern Red Bat	Hoary Bat	Northern Flying Squirrel	Gray Wolf
MAJOR												
Northeast Sands		H		H	H						H	M
Northwest Sands		H	H	H	H	H					H	H
IMPORTANT												
Central Sand Plains		H		H	H		M	M	M	M		H
Northern Highland	H	H	H	H	H				M		H	H
Northern Lake Michigan Coastal		H		H	M		M	M	M	M	H	M
Superior Coastal Plain			M	H	H		M	M	M	M	H	H
PRESENT (MINOR)												
Central Sand Hills		H		H	M		M	M	M	M		M
North Central Forest	H	H	H	H	H		M	H	M	H	H	H
Northwest Lowlands			H	H	H		M	M	M	M	H	H

Color Key

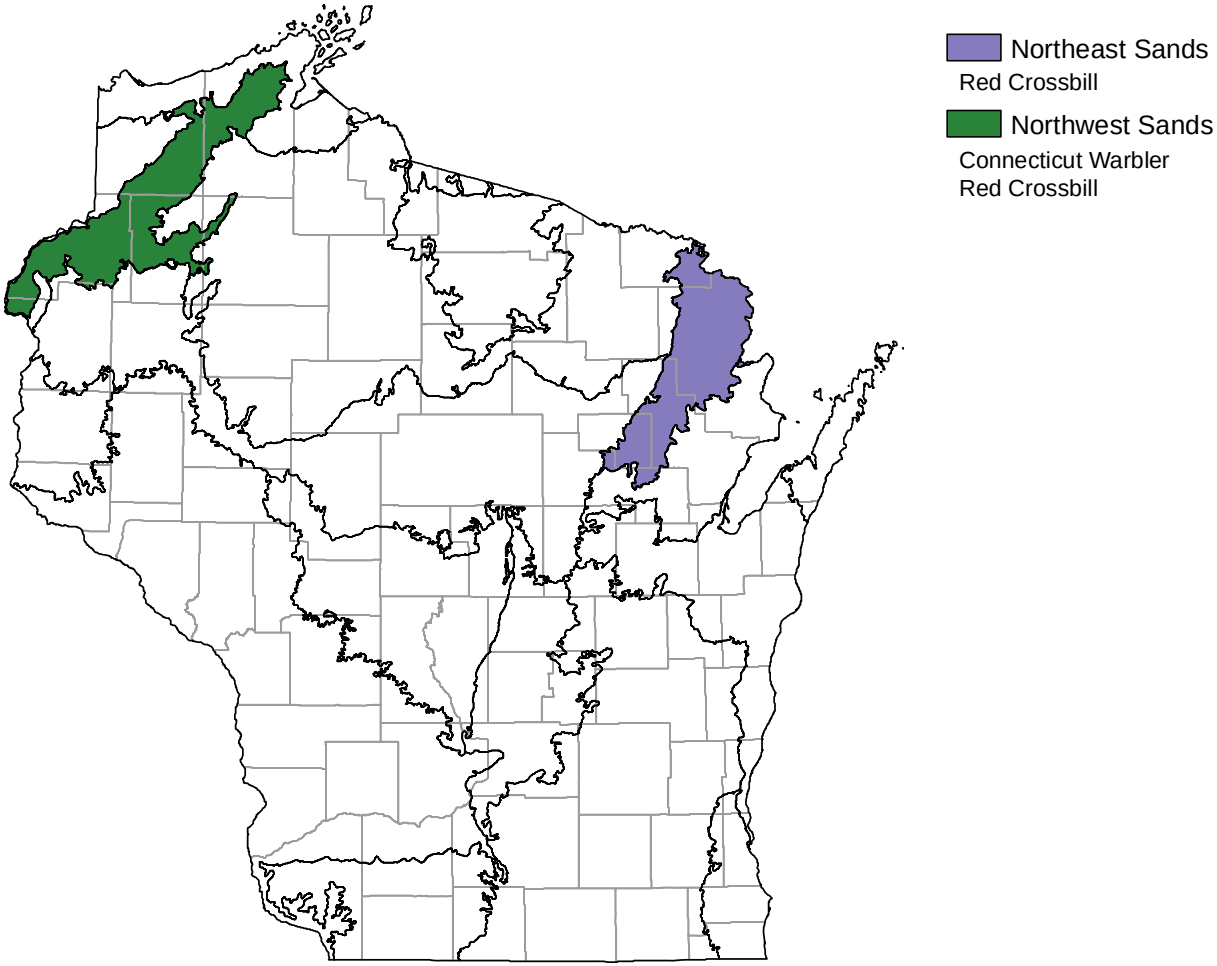
H = **HIGH probability the species occurs in this Ecological Landscape**

M = **MODERATE probability the species occurs in this Ecological Landscape**

= **LOW or NO probability the species occurs in this Ecological Landscape**

*** The number shown in parentheses is the number of Species of Greatest Conservation Need from a particular taxa group that are included in the table. Taxa groups that are not shown did not have any Species of Greatest Conservation Need that met the criteria necessary for inclusion in this table.**

Figure 3-24. Vertebrate Species of Greatest Conservation Need that have ***both* a significant association with northern dry forest ***and*** a high probability of occurring in an Ecological Landscape(s) that represents a major opportunity for protection, restoration and/or management of northern dry forest.**



3.3.5.2.3 Threats and Priority Conservation Actions for Northern Dry Forest

3.3.5.2.3.1 Statewide Overview of Threats and Priority Conservation Actions for Northern Dry Forest

The following list of threats and priority conservation actions were identified for northern dry forest in Wisconsin. The threats and priority conservation actions described below apply to all of the Ecological Landscapes in Section 3.3.5.2.3.2 unless otherwise indicated.

Threats and Issues

- Fire suppression has limited conditions that lead to natural regeneration of this community type.
- Jack pine forests tend to occur in even-aged, large plantations with unbalanced age-class distributions rather than exhibiting the patchiness that occurs under a natural fire regime. Jack pine budworm outbreaks are more severe with large contiguous acreages of older jack pine forest.
- Naturally regenerated red pine forests are very scarce, and reliable natural regeneration methods are lacking. Eastern white pine forests are also lacking, but are now regenerating naturally in many locations.
- Fragmentation can be an issue in northern dry forests in some parts of the state.
- Invasive plants such as leafy spurge, smooth brome, and spotted knapweed invade open and partially forested lands, impacting native plant communities and wildlife habitat.
- Conversion to red pine plantations is a common land use.
- Vehicle use on sandy soils can destroy vegetation and expose the loose sand beneath, leading to wind erosion and requiring long time frames for revegetation to occur. Invasive plants can easily invade and become abundant in this community after soil disturbance.

Priority Conservation Actions

- Use prescribed burning to manage and naturally regenerate northern dry forests where possible; follow existing management guidelines to minimize impacts on sensitive species.
- Managing jack pine forest in patches that emulate the landscape patterns and age-class structure created by natural fire disturbances may help reduce the magnitude of outbreaks of the jack pine budworm, as well as providing habitat niches for uncommon species.
- Develop reliable natural regeneration techniques for red pine forests.
- Use areas with a large public land base to accomplish conservation objectives.
- Look for opportunities to develop conservation partnerships with private groups, including industrial forest landowners
- Integrate planning efforts across federal, state, county, and local ownership boundaries.
- Manage dry forest within the context of other community types and utilize an integrated ecosystem management approach to limit fragmentation.
- Restrict off-road motorized use in sensitive areas. Avoid soil disturbance that leads to invasive plant establishment or wind erosion. Observations also indicate that in some cases soil disturbance and increased light levels are associated with an increase in dominance of Pennsylvania sedge (Eunice Padley, personal communication, 4 May 2005).
- Early detection and control of non-native, invasive plant species is encouraged. Use existing biocontrols and support research to find additional biocontrols for invasives.

3.3.5.2.3.2 Additional Considerations for Northern Dry Forest by Ecological Landscape

Special considerations have been identified for those Ecological Landscapes where major or important opportunities for protection, restoration, and/or management of northern dry forest exist. Those

considerations are described below and are in addition to the statewide threats and priority conservation actions for northern dry forest found in Section 3.3.5.2.3.1.

Additional Considerations for Northern Dry Forest in Ecological Landscapes with ***Major*** Opportunities for Protection, Restoration, and/or Management of Northern Dry Forest

Northeast Sands

Northern dry forests are well represented, mainly in northern Marinette and southern Florence counties. Fragmentation is less of an issue since population and road densities are low. The best opportunities for restoration and alternative management techniques are on the county forests, Pine and Popple Wild Rivers property, and the Peshtigo River State Forest. Connectivity with other forested areas should be maintained and enhanced where possible.

Northwest Sands

Northern dry forests are well represented in this Ecological Landscape, where outwash sand plains are more extensive and connected than in any other part of the state. Only in the far northern portion of the Ecological Landscape are other community types more dominant. Fragmentation is less of an issue since population and road densities are relatively low. The best opportunities for restoration and alternative management techniques are on the Polk, Burnett, Washburn, Douglas, and Bayfield County Forests; Governor Knowles State Forest and Crex Meadows (both in Burnett County); Brule River State Forest (Douglas County); and the Washburn District of the Chequamegon-Nicolet National Forest (Bayfield County). Connectivity with other forested areas in this community type should be maintained and enhanced where possible, and jack pine should be maintained on appropriate sites since it is declining statewide.

Additional Considerations for Northern Dry Forest in Ecological Landscapes with ***Important*** Opportunities for Protection, Restoration, and/or Management of Northern Dry Forest

Central Sand Plains

This community type is well represented, occurring mainly in Adams, Juneau, southeastern Wood, and southwestern Portage counties. Fragmentation is an issue in the Ecological Landscape, especially related to residential development and roads. The best opportunities for restoration and alternative management techniques are on the county forests, Quincy Bluff (Adams County), Robinson Creek and the Black River State Forest (both in Jackson County). Connectivity with other forested areas in this community type should be maintained and enhanced where possible, and jack pine should be maintained on appropriate sites since it is declining statewide.

Northern Highland

Northern dry forests are of very limited extent in this Ecological Landscape, mainly occurring as patches in the southern portion. The best opportunities for restoration and alternative management techniques are on the Vilas and Oneida county forests and the Northern Highland-American Legion State Forest. Fragmentation is less of an issue in this Ecological Landscape. Invasives are becoming a problem (e.g., Asian honeysuckle); there is still potential for controlling invasives if effective measures are taken in the near future.

Northern Lake Michigan Coastal

There are a few occurrences of northern dry forest in this Ecological Landscape, generally on the west side of Green Bay near the Peshtigo River. The best sites are under private ownership. Opportunities for management or restoration are limited.

Superior Coastal Plain

There are a few occurrences of northern dry forest in this Ecological Landscape, mostly on sand spits on the Apostle Islands, especially on Long Island. Opportunities for management or restoration are limited.